Harvesting with a Purpose

Part II: Final Harvests

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AS WE DISCUSSED in "Part 1: Intermediate Harvests," it is recommended that all harvesting efforts be coordinated by a written forest management plan. This plan should be prepared with the landowner's best interests in mind by a competent resource professional, and should be customized to meet the individual landowner's unique combination of objectives and resources. In this article, we will focus on the types of final harvests available to forest landowners.

Final Harvests

The timing and method of final harvest is arguably the most important decision that a landowner will make during the life of their forest stand. This is due to the fact that the final harvest usually yields more money than intermediate harvests and that the quality of final harvest will determine the quality of the next stand. The type of final harvest implemented in a forest also determines the age structure of the trees present in the next stand. Foresters refer to this age structure as a silvicultural management system. Silvicultural management systems are classified as either even age or uneven age.

Even Age

Under the even age management system, most of the trees in the upper canopy are the same or almost the same age. Forests in our area tend to occur naturally in even age systems. Usually there is some type of disturbance (wildfire, wind storm, flood, etc.) whereby all or most of the forest canopy is destroyed.

Trees that originate from seed, seedlings already in place, or sprouts then "battle it out" to determine which trees will occupy the canopy of the next forest. Theoretically, the trees that have the best combination of genetic capability and site quality will be the ones that win this race. Trees that do not have the genetic potential to grow fast or out compete other trees for sunlight do not survive or become suppressed. Over time, this method has the potential to improve both the quantity and quality of wood present within a forest. Forests managed under even age systems also tend to yield higher rates of return than those managed as uneven aged. Therefore, the even age system is the most common management system in the South. There are three types of harvesting used to establish an even age system: 1) Clearcut, 2) Seed tree, and 3) Shelterwood.

Clearcut–A clearcut occurs when the entire stand is removed in one cutting. Clearcutting is by far the most common method of harvesting used in the South.

A silvicultural clearcut occurs when all trees larger than 1 inch in diameter are removed to facilitate regeneration of the next stand. A commercial clearcut occurs when only the merchantable products are harvested. However, with improved utilization, enough trees are normally removed during most commercial clearcuts to facilitate regeneration of the next stand.

Seed tree–Another method of establishing an even age stand is by conducting a seed tree harvest. Under this type of harvest, the old stand is removed in one cutting, except for a small number of seed trees evenly distributed across the stand. In the South, this method is most often used to regenerate Southern yellow pines or other light-seeded species. Six to 10 of the best trees per acre are retained to establish seedlings and a prescribed burn is usually conducted to prepare the seedbed. Seed trees are usually retained for two to four years or until an adequate stand of seedlings is established, at which time they are removed. The advantage of this method of regeneration is that it has no direct cost. However, there are indirect costs associated with this method, such as the loss of seed trees to lightning and wind throw. It is also impossible to control the stocking of the seedlings that become established, and money must often be spent to conduct a pre-commercial thin to reduce the number of seedlings per acre.

Shelterwood–This method is similar to the seed tree method with the exception that the old stand is removed in a series of harvests. Under the shelterwood method, trees are removed in a series of three to four harvests. While this type of harvest/regeneration has been successfully implemented in Southern yellow pine, it is most often successful in establishment of bottomland oaks. The U.S. Forest Service has successfully utilized the shelterwood method in Crossett, Arkansas, and the Wheeler Wildlife Refuge in north Alabama has had success with establishing Nuttall oak using this method.

Uneven Age

With this silvicultural management system, the mature timber is removed–usually the oldest or largest trees–either as single scattered individuals or in small groups at relatively short intervals, repeated indefinitely. This way the continuous establishment of reproduction is encouraged and an uneven aged stand is maintained. Under this type of management system, trees from each diameter class must be removed in proper proportions and at regular intervals.

Landowners using this method of management should seek the assistance of a professional forester to mark the trees to be removed and monitor the harvesting activities.

Stands managed under the uneven aged system will typically yield lower timber revenues and will incur greater costs over the life of the stand. All of this adds up to lower rates of return when compared to even age management systems. If an economic rate of return is not a primary objective and a landowner has access to a professional forester who is

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familiar with this type of management system, uneven aged stands can be accomplished and successfully maintained in most areas of the South.

Landowners should be cautious of the "diameter limit" method of harvest. Under this method, only trees of a predetermined size or larger are removed. According to the forest inventory conducted by the U.S. Forest Service, the amount of land classified as "hardwood" in the Tennessee Valley has increased over the last 60 years. However, the amount of quality hardwood has decreased. While widespread uncontrolled burning of Southern forests has contributed to this phenomenon, most foresters believe the primary cause for the reduction in quality is the diameter limit harvesting method.

Until the mid to late 1980s, the primary harvesting method in the Tennessee Valley was a selective harvest (diameter limit). Typically, a timber purchaser would convince the landowner to harvest the larger, older trees and the smaller, younger trees would then be free to grow and take their place. Using this rationale, there would be a perpetual forest and income would be realized at regular intervals rather than once every 40 years. While this method sounds logical, it tends to work against the forest's natural tendency. Forests in North America tend to be even aged (recall the earlier discussion). Most of the trees that are larger are not older; they simply have a better combination of genetic capability and a quality site.Therefore, if the trees with the best genetic potential are removed repeatedly, the potential for the forest to produce quality timber diminishes with time. This type of harvesting is known to foresters as "high-grading" and is not recommended.

Summary

Harvesting can either be applied to an existing stand or used to establish a new one. The best method and timing of harvesting is dependent upon a landowner's objectives and the resources that are available. By understanding the various types of harvesting and obtaining a written forest management plan, a landowner is much more likely to "Harvest with a Purpose."

Reference

Smith, David M. **The Practice of Silviculture**: 8th Edition. New York: John Wiley & Sons, 1986.